

**CONTEXT**

Creating an effective **monthly monitoring dashboard** for FP division to identify and flag high-risk claims that are non-compliant with SOPs, and perform employee expenditure analysis

**PROBLEM STATEMENT**

The system used to submit claims, myClaims, is **not equipped with monitoring and anomaly detection capabilities.**

**FOCUS AREA**

- Detect anomalies through different tests and quantify their financial impact
- Identify employees with patterns of exceeding or maximising claim limits by amount (\$) and frequency

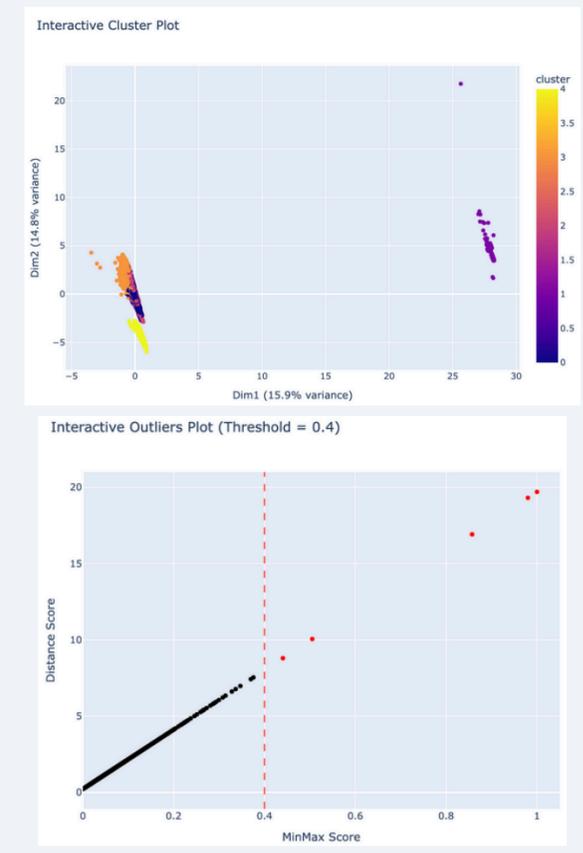
**OUR APPROACH**

**1. Anomaly Detection Tests**  
BigQuery: Applied relevant anomaly detection tests and set reasonable thresholds  
[E.g. K-means clustering (Python), Z-score and IQR analysis: If claim > threshold, flagged as anomalous "1"].

**2. Weighted Risk Scoring**  
Aggregate individual test results into weighted risk scores.  
Total risk score (up to 1.0 per claim) = Sum of weights assigned by flagged tests.

Employee	Dup. Test	Weight	Cluster Test	Weight	Risk Score
100123	0	0.1	1	0.3	0.3
102245	1	0.1	1	0.3	0.4

**3. Dashboard Development**  
Looker Studio: Based on test findings, created an interactive dashboard that offers insights into employee claims and flagged claims.



**KEY FINDINGS**

**Financial Impact**

This chart shows 'Amount' (left y-axis, 0 to 2M) and 'No. of Claims' (right y-axis, 0 to 15K) for four categories: High Values, Weekend/PH Claimed, Clustering Test, and Duplicate Claims. High Values has the highest amount (~1.8M) and number of claims (~12K). Weekend/PH Claimed has the highest number of claims (~14K) but a lower amount (~0.5M).

**Expense Claims Categories**

The 'Top Expense Claims by Count' chart is a horizontal bar chart showing 'Normal' (blue) and 'Anomaly' (red) counts for categories: Local Transport, Sundry Expenses - Ot, Pt of Sale Marketing, Overseas travel, and Others. Local Transport has the highest total count (~28K). The 'Expense Claims by Amount (\$)' chart is a horizontal bar chart showing 'Total Amount (\$)' (blue) and 'Flagged Amount' (red) for categories: Sundry Expenses - Ot, Local Transport, Staff Engmt Fund, Overseas travel, and Meal claims. Sundry Expenses - Ot has the highest total amount (~28K).

**Total Flagged Amount (\$) per Employee**

This horizontal bar chart shows the total flagged amount for five employees: Emp\_0105, Emp\_2057, Emp\_0496, Emp\_0200, and Emp\_1779. The bars are stacked with categories: High Values (green), Weekend/PH Claimed (red), Clustering Test (yellow), and Duplicate Claims (cyan). Emp\_0105 has the highest total flagged amount (~55K).

**Employee's Risk Score Distribution Across Tests**

Employee	Flagged Test / Total Risk Score			Grand total
	High Values	Weekend/PH Claimed	Weekend/PH Approved	
Emp_0925	1.2	6.73	4.05	23.37
Emp_0807	0.6	-	1.15	21.2
Emp_1779	12.4	1.05	2.7	16.16
Emp_0253	-	6.75	1.9	12.36
Emp_0496	7.8	0.93	-	8.73

**LIMITATIONS**

- Due to limited data, tests such as disallowed claims and reimbursement to wrong employee could not be performed effectively
- Limited information on policy thresholds (amount (\$) and frequency of claims) to be used for each claim category

**RECOMMENDATIONS**

- Investigate high-risk employee groups by selecting samples based on high-risk claim amounts or scoring
- Update claims policy based on data-driven insights
- Strengthen internal controls for frequently flagged expense categories
- Conduct regular trainings for Reporting Officers

**Top High-Risk Employees**

- Investigate high-risk employees, either by individual risk score or total flagged amount
- Total flagged amount per employee: indicates total flagged and amount flagged for each primary flagged test
- Risk score distribution table: Higher risk score (higher severity) indicated by darker shades